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Installation Assessment Army Base Closure Program

Kapalama Military Reservation Honolulu, Hawaii

prepared for
U.S. Army Toxic and Hazardous Materials Agency

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Honolulu, Hawaii

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DISCLAIMER

The views, opinions and conclusions contained in this report are those of the author(s) and should not be construed as official Department of the Army positions or policy unless designated by other documentation.

ABSTRACT

The following report contains an analysis of historical aerial photography of the Kapalama Military Reservation, located in Honolulu, Hawaii. The analysis focused on locating and identifying any potential contamination sources within the study area using photography from 1944 to 1986.

The Environmental Protection Agency's Environmental Photographic Interpretation Center, in providing imagery analysis support for the U.S. Army's Base Closure Environmental Restoration Program, analyzed eight years of aerial photography at the request of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). Very few potential contamination sources were noted within the site. These include open storage areas, vehicle and equipment storage lots, vertical tanks, stains, ground scars, debris, mounded materials, and miscellaneous unidentified objects. Several potential contamination sources were found outside the site boundary, adjacent to the site. These include open storage areas, vertical tanks, stains, drums, coastal filling, a scrapyard, and a possible sewage treatment facility.

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BACKGROUND

The Environmental Photographic Interpretation Center (EPIC), through an interagency agreement between the U.S. Environmental Protection Agency (EPA) and the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), has provided imagery analysis support of the Kapalama Military Reservation for USATHAMA'S portion of the Army Base Closure Environmental Restoration Program.

Archival black and white photography was acquired from the imagery libraries of the United States Geological Survey, the Defense Intelligence Agency, the National Aeronautics and Space Administration/Ames Air Force Base, the Agricultural Stabilization and Conservation Service, and two private aerial survey companies.[1]

OBJECTIVE

The objective of this report was to obtain, analyze, and provide to USATHAMA aerial photographic coverage taken between 1944 and 1986. Analysis was to concentrate upon those man-made features which may have caused some deleterious alteration of ground water or surface water quality.

[1]See the References section for a complete list of all publications, maps and photography used in this report.

INTRODUCTION

On December 29, 1988, the Defense Secretary's Commission on Base Realignments and Closures delivered recommendations to the Secretary of Defense on over 100 Army installations which will be closed or realigned under the provisions of the Defense Authorization Amendments and Base Closure and Realignment Act. USATHAMA has been assigned the responsibility for conducting the environmental evaluation and restoration portion of the Base Closure program. The following analysis of historical aerial photography was conducted to support USATHAMA in obtaining data for the required environmental restoration assessments.

This study incorporates and updates portions of the analysis contained in a previous EPIC analysis of Kapalama Military Reservation, completed in 1983. Figure 1 illustrates the installation location, keyed to a photocopy of a U.S. Geological Survey (USGS) 1:24,000-scale topographic quadrangle map. A description of the site with the changes that occur during each imagery interval is found in the Aerial Photo Analysis section of this report.

Site boundaries or areas used in this analysis were determined from observations made from the aerial photography in conjunction with collateral data supplied by USATHAMA and do not necessarily denote legal property lines or ownership.

Aerial photography of Kapalama Military Reservation was obtained to represent the period from 1944 to 1986. Black and white photography for 1944, 1952 and 1968 was included from a previous report. Black and white photography for 1963, 1969, 1974, 1977 and 1986 has been obtained for this report. Black and white photography for 1977 and 1986 has been reproduced for this report. Photography from 1963, 1969 and 1974 was analyzed but not reproduced due to a lack of significant change.

The analysis was to concentrate upon locating and identifying man-made features that may have caused some deleterious alteration of ground water or surface water quality. Very few potential contamination sources were noted within the site boundary. These included open storage areas, vehicle and equipment storage lots, vertical tanks, stains, ground scars, debris, mounded materials, and miscellaneous unidentified objects. Several potential contamination sources were found outside the site boundary, adjacent to the site. These include open storage areas, vertical tanks, stains, drums, coastal filling, a scrapyard, and a possible sewage treatment facility.

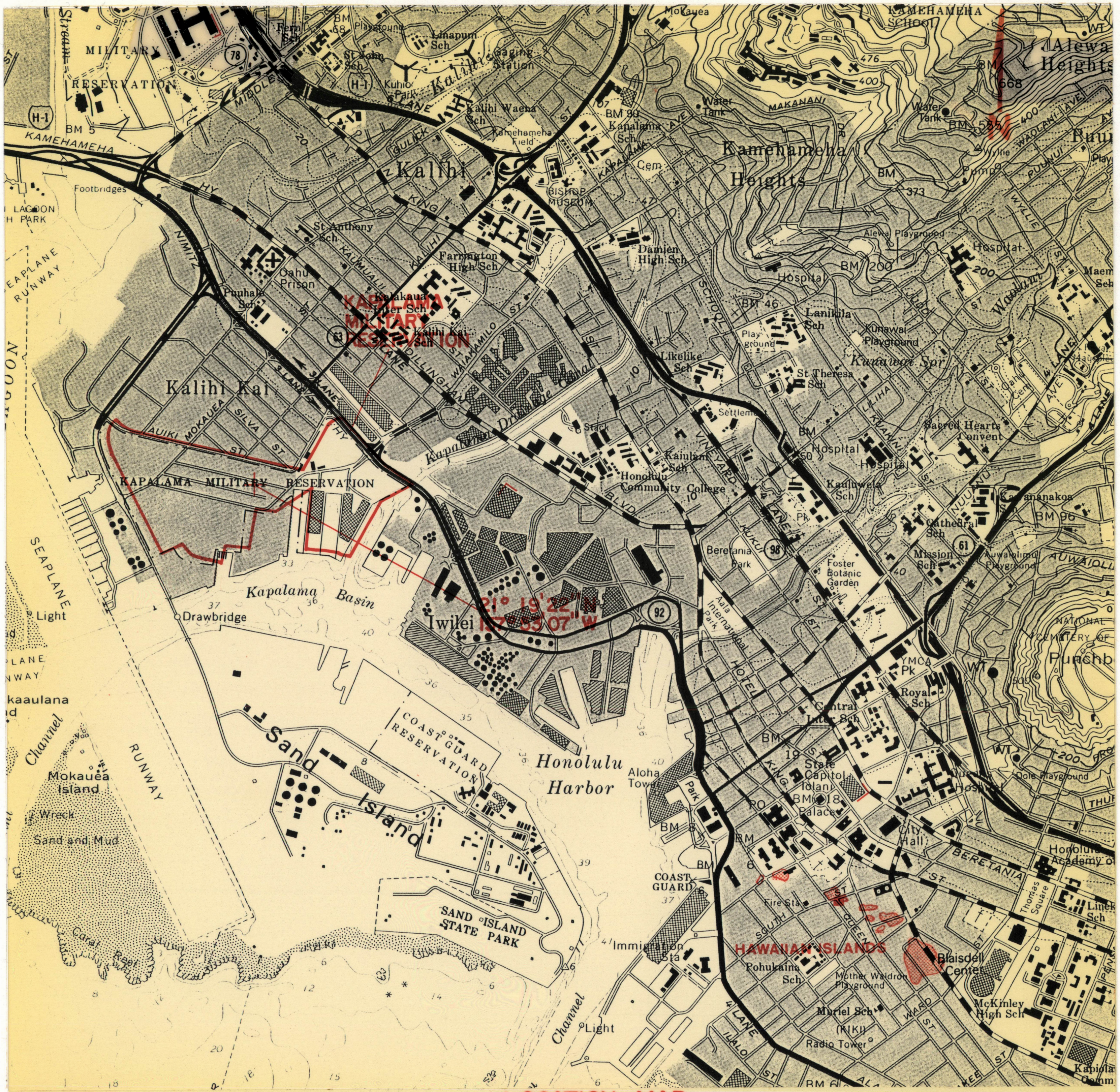

FIGURE I
KAPALAMA MILITARY RESERVATION

LOCATION MAP
HONOLULU, HI QUAD

APPROX. SCALE 1:24,000

METHODOLOGY

A search of government and commercial sources was undertaken to obtain the best available aerial photography of the installation spanning the desired time frame. The photography and other sources of information used in this report are listed in the References section.

The analysis was performed by viewing backlit transparencies of aerial photography through stereoscopes. Stereoscopic viewing creates a perceived three-dimensional effect which, when combined with viewing at various magnifications, enables the analyst to identify signatures associated with different features and environmental conditions. The term "signature" refers to a combination of visible characteristics (such as color, tone, shadow, texture, size, shape, pattern, and association) which permit a specific object or condition to be recognized on aerial photography.

Photographic prints were made from those years of aerial photographic coverage that reveal significant information about the installation. The analyst's findings are annotated on overlays to prints and/or base maps and described in the accompanying text. Site boundaries or areas used in this analysis were determined from the aerial photography in conjunction with collateral data supplied by USATHAMA and do not necessarily denote legal property lines or ownership.

An approximate scale has been calculated for each print. The scale is expressed as a ratio of the distance between two points on the print and same two points on the ground (e.g., 1:20,000, where 1 refers to a unit of distance on the print). This ratio is considered an approximate scale because the accuracy of distance measurements is limited by factors such as the image distortion intrinsic to aerial photography, the expansion or shrinkage of the print, and the precision of the measuring device. The approximate scale represents an average of several calculations rounded to the nearest hundred.

Due to factors inherent in the photographic printing process, prints do not exhibit the level of detail that is visible in the original aerial photography. Therefore, some features identified from the aerial photography may not be clearly discernible, or even visible, on the photographic prints presented in this report.

The terms "possible" and "probable" are used to indicate the degree of certainty of signature identification. "Possible" is used when only a few characteristics are discernible or these characteristics are not unique to a signature. "Probable" is used when incrementally more characteristics are discernible. No qualifying terms are used when the characteristics of a signature allow for a definite feature identification.

AERIAL PHOTO ANALYSIS

The Kapalama Military Reservation lies northwest of Honolulu Harbor and south of the residential area of Kalihi Kai.

SEPTEMBER 28, 1944 (FIGURE 2)

The installation appears active in 1944, although construction (not annotated) and coastal filling are still underway around the installation. Open storage (OS) areas are located throughout the installation. The resolution of the imagery is inadequate for positive identification of stored materials; however, much of it appears to be piled containers. Some industrial activity and staining (ST) are present near the conveyor in the northwestern part of the installation. A vehicle and equipment storage (VES) lot is located in this area as well. A pile of cylindrical objects is visible in the southeast corner of the installation. These objects appear too large to be standard drums; however, they are similar in shape.

Filling activity and debris (DB) are present north of the installation, possibly representing a municipal landfill operation. A large ditch is located west of the site boundary.

LEGEND

C	- Containers
CL	- Cleared Area
D	- Drums
DB	- Debris
GS	- Ground Scars
DSB	- Dismantled Building
LT	- Light-toned
MM	- Mounded Material
O	- Objects
OS	- Open Storage Area
SL	- Standing Liquid
ST	- Stain
SY	- Scrap yard
VES	- Vehicle and Equipment Storage Area
VT	- Vertical Tank
WG	- Wet Ground
—·—·—	- Drainage
— — —	- Feature Boundary
—x—x—x—	- Fence
IIIIIIIIII	- Revetment
▬▬▬	- Installation Boundary
- - - - - -	- Historical Feature Outline

FIGURE 2
KAPALAMA MILITARY RESERVATION SEPTEMBER 28, 1944 APPROX. SCALE 1: 6,700

APRIL 3, 1952 (FIGURE 3)

By 1952 construction of the installation is nearly complete. A large ground scar (GS) is present in the northwest corner of the installation. The vehicle and equipment storage area present in 1944 is no longer visible. The eastern portion of the installation is now a neat open storage area and parking lot (not annotated). A number of stained/wet ground (WG) areas are visible within the installation; however, they do not appear to be associated with any specific site or activity.

A probable scrapyard (SY) which contains mounded scrap material (not annotated) is present northwest of the installation. This feature appears throughout the remainder of the period of analysis and will continue to be annotated but will no longer be discussed.

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ST - Stain
SY - Scrap Yard
VES - Vehicle and Equipment Storage Area
VT - Vertical Tank
WG - Wet Ground
——·—— - Drainage
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—•—•—•— - Fence
|||||||||| - Revetment
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FIGURE 3
KAPALAMA MILITARY RESERVATION APRIL 3, 1952 APPROX. SCALE 1:5,800

FEBRUARY 6, 1968 (FIGURE 4)

Photography from 1963 has been analyzed and included in this year of analysis. By 1963, construction and coastal filling activity appeared to be complete. In 1963, a fenced open storage area containing areas of probable stained/wet ground (not annotated) was first seen in the northwest corner of the installation. In 1963, a vehicle and equipment storage area and an open storage area were visible inside the northeast corner of the installation. Seven probable vertical tanks (VT) are located in this area, including two that are open and probably empty.

During 1963 and 1968 little activity is present within the installation; however, eight open storage areas, which all contain probable stained/wet ground areas (not annotated), are visible near the installation. A revetment containing four vertical tanks is present south of the installation. Possible drying beds for sewage treatment are visible in this area (first visible in 1963). Two ground scars are present south of the possible drying beds, suggesting that a breach is present.

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FIGURE 4
KAPALAMA MILITARY RESERVATION FEBRUARY 6, 1968 APPROX. SCALE 1:8,300

JANUARY 29, 1977 (FIGURE 5)

Photography from 1969 and 1974 has been analyzed and included in this year of analysis. By 1977, most of the materials located within the large fenced open storage area visible in 1968 and 1969 have been removed and the area cleared (CL). Approximately 60-120 stacked probable containers (C) are visible adjacent to the cleared area. Few vehicles and equipment are present and one building has been dismantled (DSB). Several isolated stains are present within the site. One stain is located near a fenced area in the eastern portion of the site that contains approximately 14 light-toned (LT), nearly cylindrical objects (O).

In 1969, 1974 and 1977, several open storage areas were located outside the perimeter of the installation. In 1977, a group of approximately 75 to 125 possible drums (D) is present within an open storage area west of the installation boundary. Probable debris and two stained/wet ground areas are present within open storage areas south of the installation boundary. Three revetted areas containing vertical tanks are now present south of the installation boundary. The northernmost tank area was under construction in 1969 and completed in 1974. The southernmost revetted tank area is seen where the possible drying beds for sewage treatment were located in 1974. A small area of coastal fill is present in a small area southwest of the installation.

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FIGURE 5
KAPALAMA MILITARY RESERVATION JANUARY 29, 1977 APPROX. SCALE 1:8,500

MAY 24, 1986 (FIGURE 6)

Two vehicle and equipment storage areas are present. The open storage area located within the western perimeter in 1977 is completely cleared. Two open storage areas are present, as are three areas of probable debris (possibly scattered crates). Four small mounds of material (MM) are present near the open storage areas. The fenced area which contained 14 light-toned objects in 1977 is no longer present.

Open storage areas outside the installation also appear vacant at this time; however, three vertical tanks, a group of approximately 30 probable drums and a stained/wet ground area are present in open storage areas south of the installation. The central vertical tank revetment southwest of the installation contains standing liquid (SL).

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- ST - Stain
- SY - Scrap yard
- VES - Vehicle and Equipment Storage Area
- VT - Vertical Tank
- WG - Wet Ground
- Drainage
- Feature Boundary
- Fence
- Revetment
- Installation Boundary
- Historical Feature Outline

FIGURE 6
KAPALAMA MILITARY RESERVATION MAY 24, 1986 APPROX. SCALE 1:8,600

REFERENCES

AERIAL PHOTOGRAPHY

Date	Agency	Mission Code	Agency Frame #	Orig. Scale	EPIC Frame #
September 28, 1944	DIA[1]	IBV	10-12	1:22,000	---
April 3, 1952	Original source not available				
January 12, 1963	ASCS[2]	EKM	206,207	1:24,000	26793,26794
February 6, 1968	USGS[3]	VXJS	---	1:24,000	---
October 2, 1969	TOWILL[4]	5063	5060:18,19	1:17,000	26766,26767
October 16, 1974	NASA/AM[5]	---	2,3	1:30,000	26773,26774
January 29, 1977	TOWILL	---	7073:2,3	1:25,000	26764,26765
May 24, 1986	AIRSHIP[6]	1010	2:5,6	1:40,000	28047,28048

MAP

Source	Name	Scale	Date
USGS	Honolulu, HI	1:24,000	1983

PUBLICATION

Dollison, R.M. 1983. Installation Assessment, United States Army Support Command, Hawaii (USASCH). U.S. Environmental Protection Agency, Environmental Photographic Interpretation Center. Report No. TS-PIC-82001.

[1]Defense Intelligence Agency, U.S. Department of Defense

[2]Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture

[3]United States Geological Survey, U.S. Department of the Interior

[4]Towill Corporation, Honolulu, Hawaii

[5]National Aeronautics and Space Administration, Ames Air Force Base

[6]Air Survey Hawaii, Honolulu, Hawaii